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Multimedia and Control Networking Technology

OptoLyzer OL3025o

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User Manual

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Media **O**riented **S**ystems **T**ransport

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Legend

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OptoLyzer OL3025o

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1.0.X-3	2006-06-26		SMSC style adapted
		2.1	Feature list adapted
		3.1.1	Table 3-1: LED status: more details
		5.2	Table 5-2: assignment corrected
1.0.X-2	2006-03-09	4.3	Update OS8805: Hint for loop-back mode added
		4.4	Update OS8805: Hint for loop-back mode added
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1 Preface

1.1 Intended Use

This SMSC product is intended to be used for developing, testing, or analyzing MOST® based multimedia products and systems by persons with experience in developing multimedia devices.

The operation of this SMSC product is only admitted with original SMSC devices, e.g., provided power supply.

1.2 Scope of Delivery

The OptoLyzer OL3025o is delivered with:

- OptoLyzer OL3025o
- User Manual (printed version)
- Power-supply
- Cables
- Accessories

Please check your shipment for completeness.
Please direct complaints to sales-ais-europe@smsc.com (Europe and Asia) or to sales-ais-usa@smsc.com (America). Providing the delivery note number eases the handling.

1.2.1 Software on the CompactFlash

The CompactFlash™ comes with:

- Microsoft Windows CE™ as operating system
- Microsoft Windows CE loader
- Extended software with spy functionality and MOST drivers, MOST Server

1.2.2 Software on the USB Stick

The USB stick comes with a complete backup of the CompactFlash. In addition, maintenance utilities are offered on the USB stick (described in section 4.2 on page 20).

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1.3 Term Definitions

For better understanding of the following chapters, this section provides explanation to special terms, used in the description of the OptoLyzer OL3025o.

Term	Definitions
Client	The connected laptop/PC is called client, additional or target PC. The OptoLyzer OL3025o is designated as host.
Controlling software	A software that is running on the client. It manages the communication with the OptoLyzer OL3025o. The controlling software comprises both the handling of spied data and performing control tasks.
Event	The OptoLyzer Suite is working with a common format. Therefore the incoming data is converted to Events.
Host	The OptoLyzer OL3025o is designated as host. The connected laptop/PC is called client, additional or target PC.
INIC	Intelligent Network Interface Controller
MOST Server	The MOST Server is an application that starts automatically on the OptoLyzer OL3025o. It manages control and/or analyzing tasks and the communication to the connected laptop/PC the OptoLyzer Suite is running.
OptoLyzer G2 3025o	This product comprises OptoLyzer Suite and OptoLyzer OL3025o.
OptoLyzer OL3025o	Hardware of the OptoLyzer G2 3025o. It will be connected into the MOST Network. Afterwards it takes the data for further processing.
OptoLyzer Suite	This is the software of the OptoLyzer G2 3025o. It covers the OptoLyzer Suite main window and Viewer, Recorder, Graph and Watch. In addition, the Transceiver and the MOST Interface Control can be started in the OptoLyzer Suite.
POF	Plastic optical fiber

Table 1-1: Term Definitions

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2 Introduction

The OptoLyzer OL3025o is a versatile hardware for debugging and analyzing Control and Packet data in a MOST25 optical network. It provides connection to the MOST25 optical network via a MOST oPHY connector that is based on the Optical Physical Layer. When used in combination with the OptoLyzer Suite all data is transferred via an Ethernet connection to a PC running the installed OptoLyzer Suite. The device is prepared to work in laboratory (stationary) environments (voltage range of 100 – 240 V DC transformed to 12 V). The OptoLyzer OL3025o is able to run in timing master mode, slave mode and bypass mode.

2.1 Features in Use with OptoLyzer OL3025o

These are the features of the OptoLyzer OL3025o:

- Versatile MOST Network analysis tool for Control and Packet data
- MOST25 network optical interface
- 2 independent MOST nodes (One node is acting as a spy, one node is acting in bypass, master or slave mode. This node allows sending and receiving of MOST control data.)
- Remote connection via ethernet interface
- Routing of 1 MOST synchronous channel to Line OUT
- 4 opto-coupled TTL hardware trigger
- LEDs indicating different states of device and network
- Support for 44,1 kHz and 48 kHz system sample rates
- Time stamp resolution: 1µs; accuracy: 1 frame
- Optical fibers
- Bootable USB stick for firmware update and service purposes
- Optional connections for keyboard, mouse and monitor

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2.2 Typical Application

A MOST Network might consist of various MOST devices. State-of-the-art multimedia systems need powerful tools for both finding of irregularities and controlling of the MOST Network's interfaces. The OptoLyzer OL3025o is developed to perform these tasks.

A typical application is depicted in Figure 2-1 below. The OptoLyzer OL3025o is part of the MOST Network and spies its data. The data is transmitted to a connected PC via an Ethernet connection. A controlling software (e.g., OptoLyzer Suite) handles the spied data. Additionally, control tasks can be performed via a controlling software.

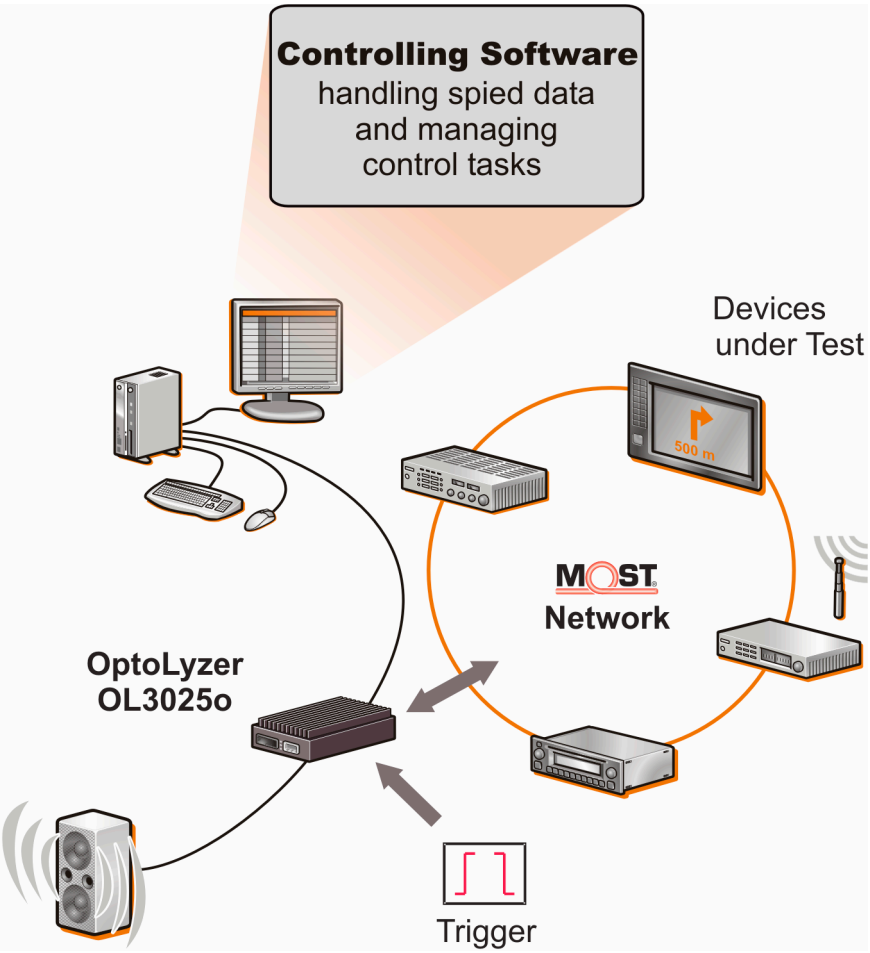

Figure 2-1: Typical Application of the OptoLyzer OL3025o

The following sections describe the concepts for both:

- Analyzing the MOST Network as spy

And

- Performing control tasks (via e.g., OptoLyzer Suite)

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2.2.1 Analyzing the MOST Network as Spy

The OptoLyzer OL3025o provides full spy functionality. Since the OptoLyzer OL3025o is always configured as spy it has simply to be connected in a MOST Network to use this feature. As spy it is able to deal with heavy data loads. Data recovery is ensured. The OptoLyzer OL3025o spies the complete traffic on the Control data channel and the Packet data channel of a MOST Network. An included application – the MOST Server - takes the incoming data and converts it into a common format named 'Events'. The MOST Server provides a socket connection for further processing. If the OptoLyzer OL3025o is used in combination with controlling software the spied data can be displayed in different kind. E.g., the data can be monitored in a window for on-line analyzing. Furthermore the data can be shown in a graph for statistic purposes. Even data recording is possible for off-line analyzing (see Figure 2-1). Hardware trigger inputs allow interfacing with external hardware events.

2.2.2 Performing Control Tasks

The OptoLyzer OL3025o can also operate as timing master or slave. Then the OptoLyzer OL3025o supports performing control tasks via controlling software on a client. For example the mode of the OptoLyzer OL3025o can be changed. Normal operation assumed, messages can be sent and viewed for e.g., test or simulation on the MOST Network. In addition, the OptoLyzer OL3025o is able to route streaming data.

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3 Installation

This chapter describes the elements and connectors of the OptoLyzer OL3025o. A connectivity diagram shows how to connect the OptoLyzer OL3025o and the client in a typical MOST Network application.

Specific aspects of the software structure (OptoLyzer OL3025o software and OptoLyzer Suite on the client PC) are shown in section 3.2 and 3.3.

3.1 OptoLyzer OL3025o System Description

The OptoLyzer OL3025o comes with all components configured and prepared for default operation. When used in combination with the OptoLyzer Suite it needs to be connected to a PC running the OptoLyzer Suite. The following sections describe the different views of the OptoLyzer OL3025o. Service aspects as e.g., an update procedure are handled in chapter 4 on page 18.

3.1.1 Front View of the OptoLyzer OL3025o

The front view of the OptoLyzer OL3025o provides access to external interfaces and elements for controlling and information.

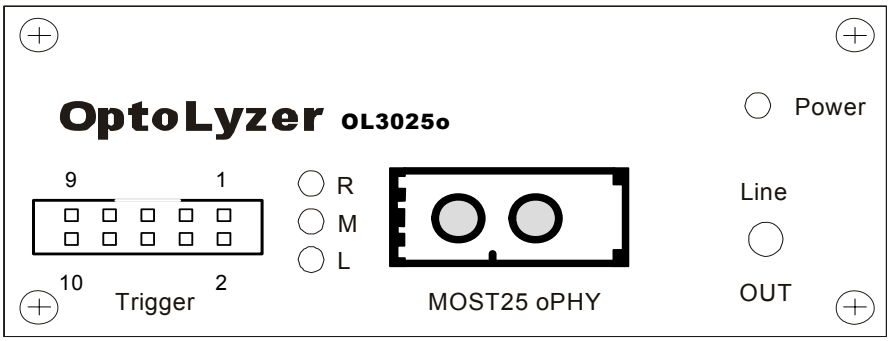

Figure 3-1: OptoLyzer OL3025o (Front View)

The components are described from left to right:

Hardware trigger interface:
There are four hardware trigger inputs that can be used if needed. In the spy operation mode the software will detect input hardware trigger changes and send them over the Ethernet. For further technical details refer to chapter 5.2 on page 24.

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LEDs:
To the right of the hardware trigger interface there are three LEDs among each other. Each of them is supporting different functionalities depending on the operating mode.

LED label	Color	Description
R (Ready)	Red	The red LED indicates different start up states of the OptoLyzer OL3025o. If it is continuously lighting the OptoLyzer OL3025o is ready. This LED is blinking if a twinkle command is sent from the OptoLyzer Suite (twinkle LED).
M (Message)	Yellow	This LED is on if: • the MOST Network is locked and • the OptoLyzer OL3025o is in node mode (master or slave) and • a Control or Packet message is addressed to the OptoLyzer OL3025o node.
L (Lock)	Green	This LED is on when the MOST Network is locked.

Table 3-1: Status LEDs

MOST Interface
The OptoLyzer OL3025o can be connected to the MOST Network via a Yazaki 2+0 connector. The optical parameters of the connector are compliant to the MOST Specification.

- Tx: Optical output for MOST Network
- Rx: Optical input for MOST Network

Audio Line OUT:
The OptoLyzer OL3025o provides one audio output connector to the right on its front panel. For technical details refer to section 5.2 on page 24.

LED Power:
This green colored LED indicates that power is switched on.

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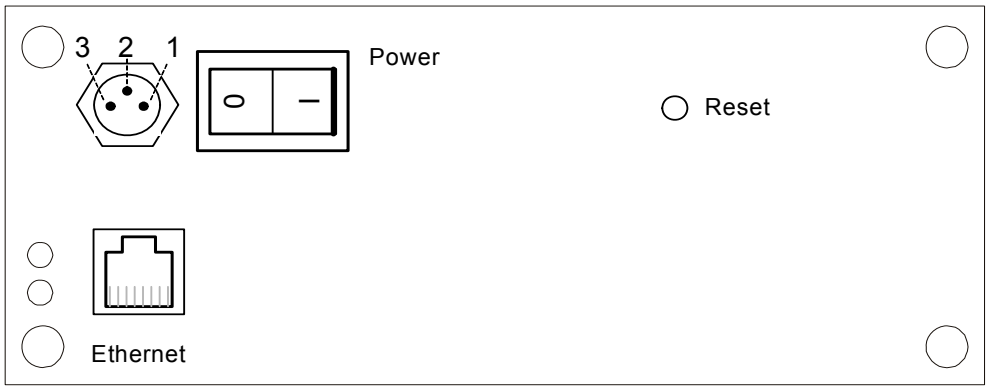
3.1.2 Rear Panel of the OptoLyzer OL3025o

The rear panel of the OptoLyzer OL3025o provides access to power jack, power switch, a reset button, and interfaces to a remote PC. In addition, several service interfaces are supported but hidden behind a service panel. This panel must be removed in a service case to get access to the hidden service interfaces. The normal operation mode is depicted below. The service mode is described in chapter 4 on page 18.



Normal operation

Figure 3-2: OptoLyzer OL3025o (Rear Panel: Normal Operation)

All components of the rear panel are described from left to right and top down:

Power jack (mains):
The power jack needs a power supply in a voltage range of 8 V – 30 V DC and a power consumption of max. 3 A. The OptoLyzer OL3025o comes with an AC power supply unit (voltage range from 100 V to 240 V). For technical details refer to section 5.2 on page 24.

Power on/off switch:
The power on/off switch is located to the right of the power jack. In position ‘I’ the OptoLyzer OL3025o is on, in position ‘0’ the power is switched off.

The OptoLyzer OL3025o supports ignition. If pin 2 (ION) is connected with GND the OptoLyzer OL3025o is switched off. If pin 2 (ION) is not connected or is connected with a high level signal (8 V – 30 V) the OptoLyzer OL3025o is switched on. For technical details refer to section 5.2 on page 24.

Reset:
If this button is pressed the OptoLyzer OL3025o is restarted.

Ethernet Interface:
This interface is the standard communication port that connects the OptoLyzer OL3025o to a PC via a 100Base-T Ethernet connection. The OptoLyzer Suite running on this PC is able to control the OptoLyzer OL3025o and to receive its data. The connector is a standard RJ45. Left hand two LEDs give information on connection (Link LED: yellow) and traffic (Activity LED: green).

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3.1.3 Connectivity Diagram

The following sections describe how the OptoLyzer OL3025o can be integrated in a MOST50 network. In addition the connections are shown that are mandatory like the 100Base-T Ethernet connection with the laptop/PC running controlling software and the power supply. Furthermore some connections are menitioned that can be used for optional functionality like monitor, mouse, keyboard, and analog audio devices.

3.1.3.1 Connectivity Diagram – Front Panel

Figure 3-3 depicts the connectivity diagram of the front panel.

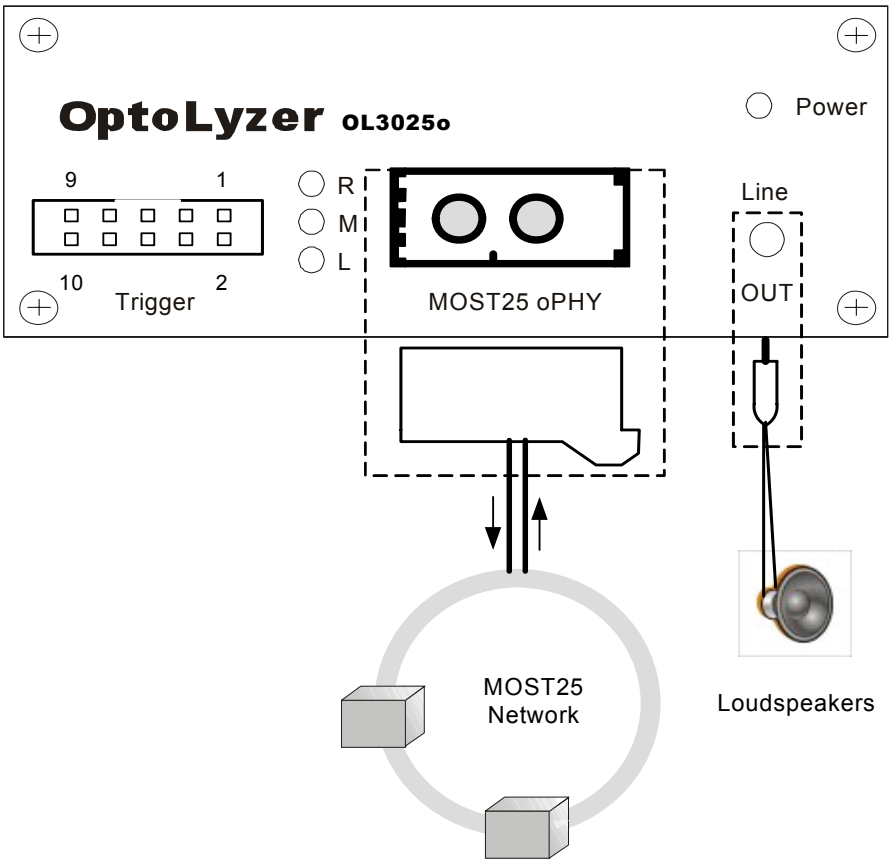

Figure 3-3: Connectivity Diagram – Front Panel

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3.1.3.2 Connectivity Diagram – Rear Panel

The connectivity diagram of the rear panel is depicted in Figure 3-4.

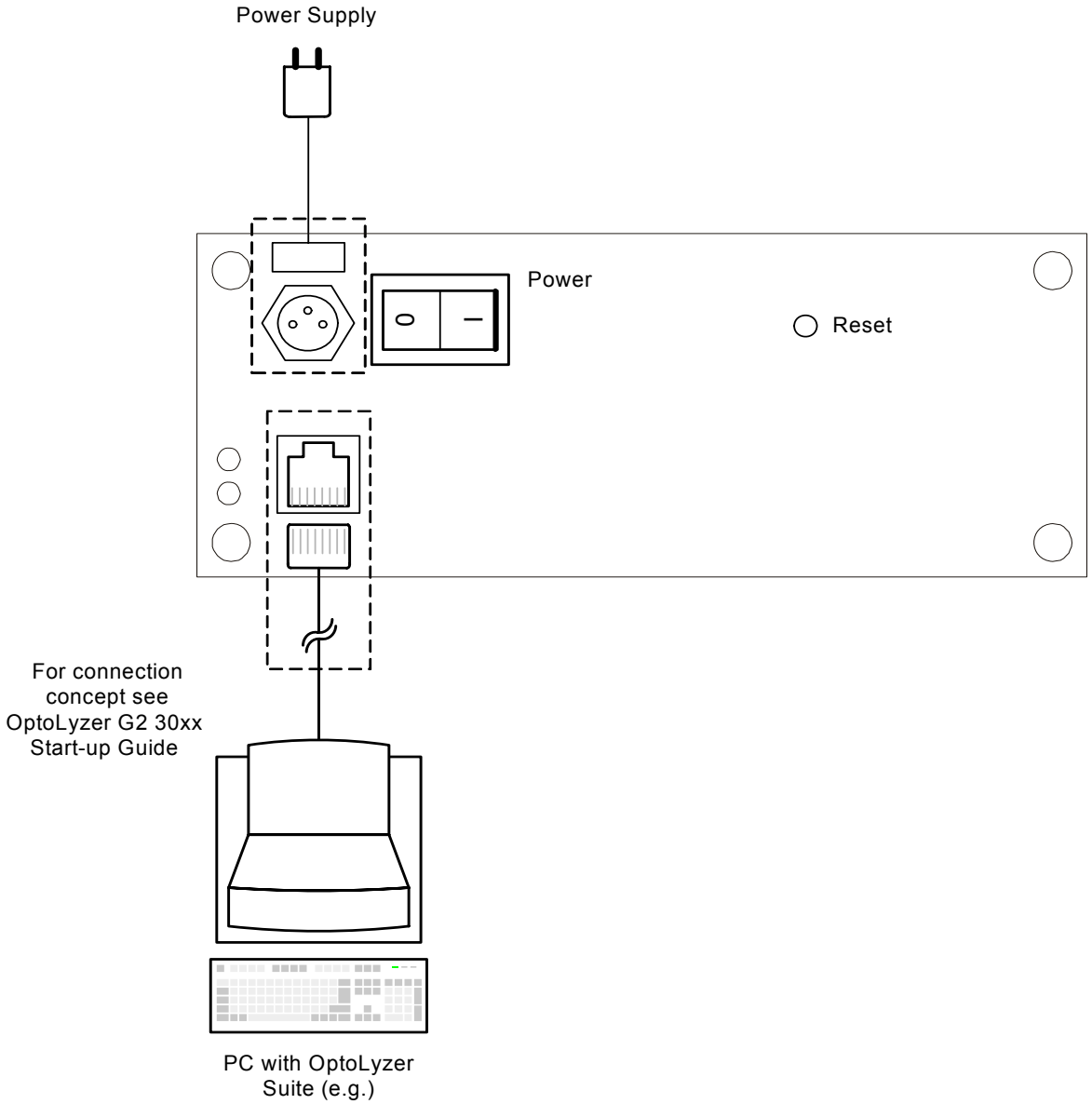

Figure 3-4: Connectivity Diagram – Rear Panel (Normal Operation)

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3.2 Software on the OptoLyzer OL3025o

The OptoLyzer OL3025o is delivered ready for use. All software components are provided as a firmware image on a 64 MB CompactFlash. This image is based on the operating system Microsoft Windows CE™ extended by modules needed for MOST, communication interfaces and the server application. A bootable USB stick comprises a backup image of the CompactFlash.

Note:
If both, the USB stick and the CompactFlash are inserted at the same time, the OptoLyzer OL3025o will use the USB stick during the startup procedure by default.

3.3 Laptop/PC and OptoLyzer OL3025o Software Structure

When the OptoLyzer OL3025o is switched on a specific application – the MOST Server – starts up automatically. It manages control and/or analyzing tasks and the communication to a connected laptop/PC controlling software is running on.

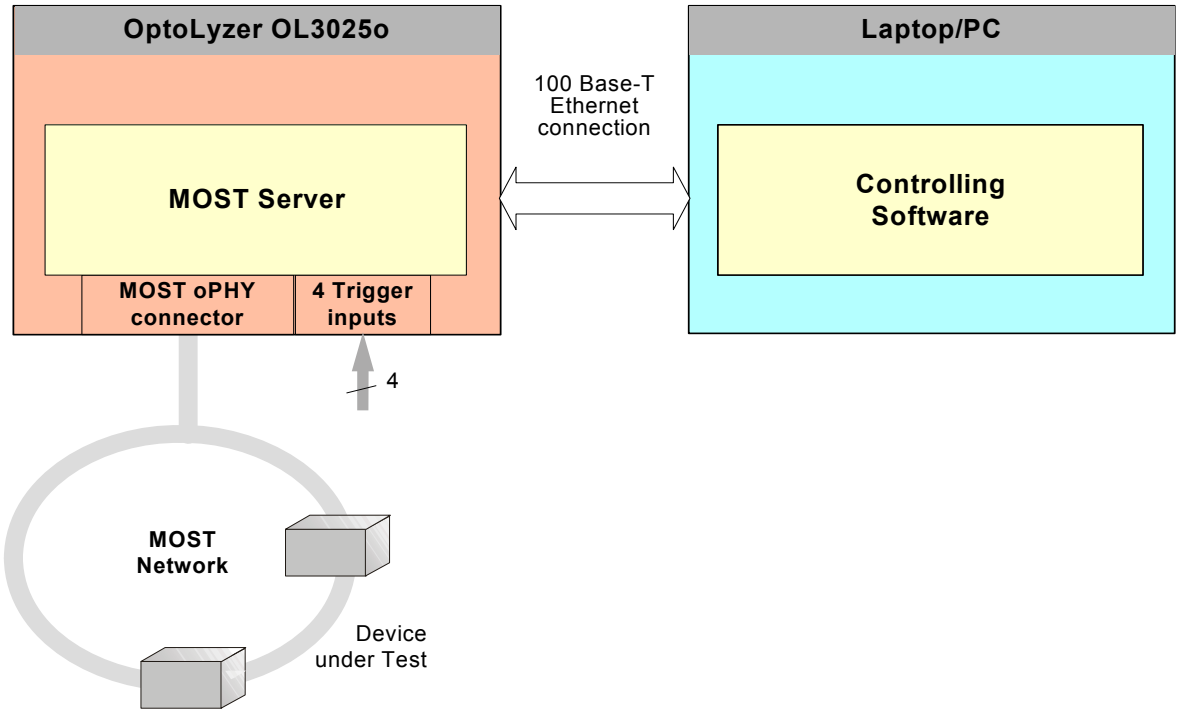

Figure 3-5: Software Structure

The interaction of the two software parts is managed via a 100 Base-T Ethernet connection. It is shown in Figure 3-5 above. The OptoLyzer OL3025o provides two logical channels for communication: a spy and a control channel. The channel, which handles controlling tasks, operates bidirectional, the channel, which transfers spy data, operates unidirectional namely in direction OptoLyzer OL3025o to the connected laptop/PC. For further information refer to *OptoLyzer Socket Protocol* [1]

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4 Maintenance of the OptoLyzer OL3025o

This chapter describes how to get access to the service panel and its interfaces. Section 4.2 covers the update of the CompactFlash. OptoLyzer OL3025o test and upgrade tools of the PCI Board are described in section 4.3.

4.1 Service Panel on the Rear Panel

In service cases e.g., when updating the system, the service panel must be unscrewed at the rear panel. Several service interfaces are supported but hidden behind this service panel. The service mode is depicted below. The normal operation mode and the associated interfaces are described in section 3.1.2 on page 14.

4.1.1 Rear Panel of the OptoLyzer OL3025o: Service

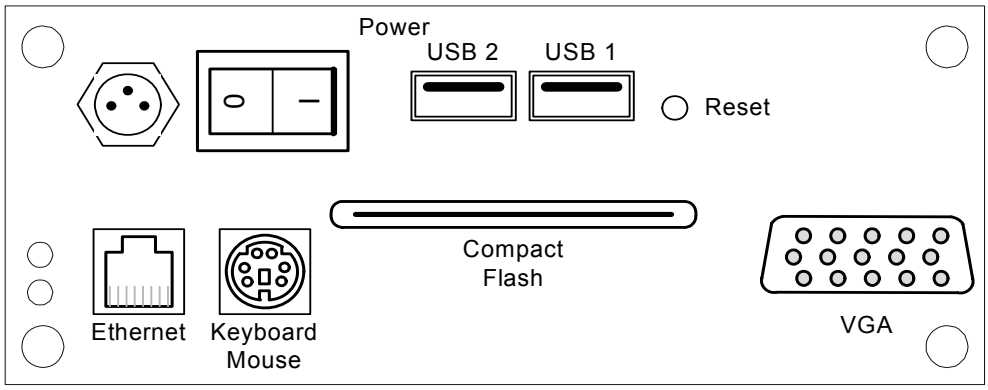

Figure 4-1: OptoLyzer OL3025o (Rear Panel: Service Operation)

Only the additional service interfaces are described below:

USB interfaces (2x):
Additional devices can be connected via 2 USB connectors. E.g., the system can be updated via an attached USB stick.

PS2 interface:
The OptoLyzer OL3025o can be used without any external interfaces, but there is a PS2 interface for mouse and keyboard. It can be useful to connect a mouse and a keyboard for more functionality. The mouse and the keyboard are not part of the shipping.

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CompactFlash slot:
A CompactFlash slot is placed in the center of the rear panel. The delivered CompactFlash provides the operating system Microsoft Windows CE™ and all other software that is necessary for analyzing and controlling purposes.

VGA interface:
The hardware of the OptoLyzer OL3025o supports a VGA interface for connecting a VGA monitor. The display will be recognized automatically. The enclosed adapter can be used for connecting a VGA monitor.

4.1.2 Connectivity

The connectivity diagram of the rear panel is depicted in Figure 4-2.

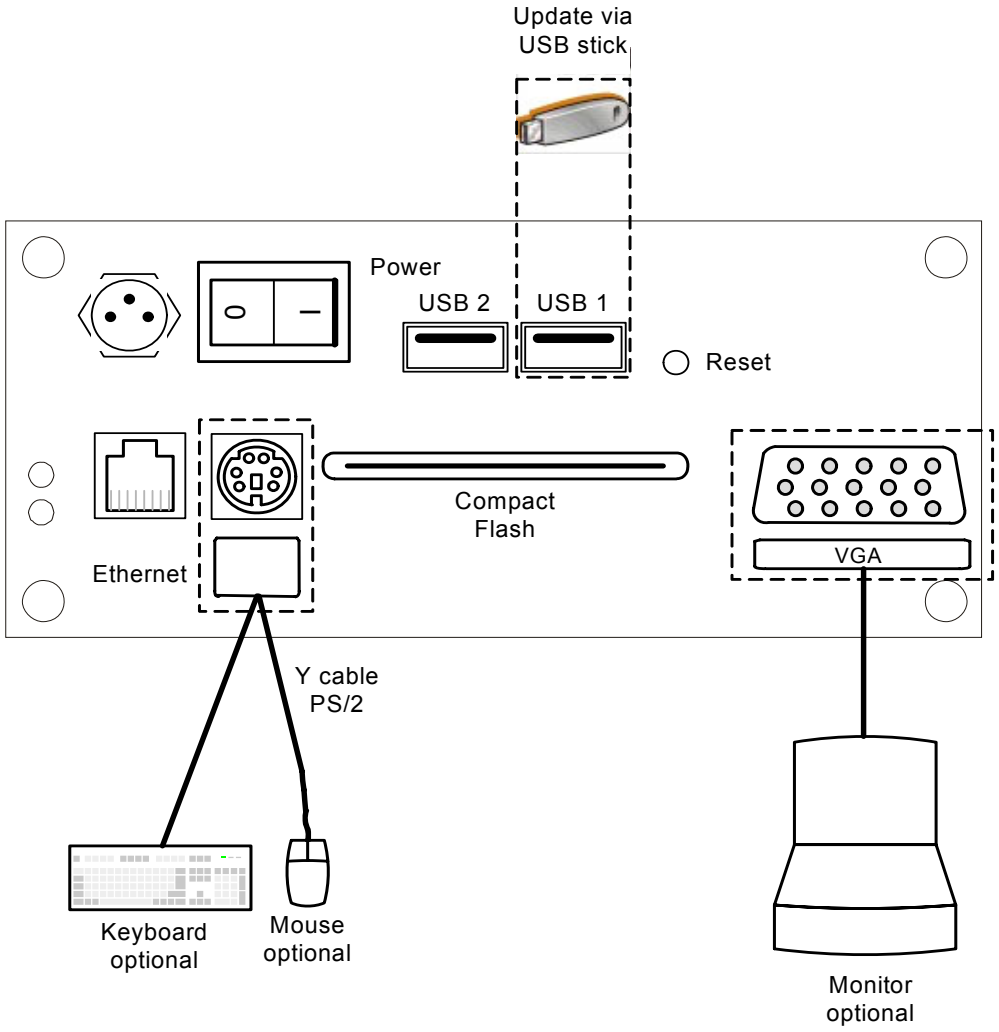

Figure 4-2: Connectivity Diagram – Rear Panel (Service Operation)

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4.2 Update CompactFlash

The OptoLyzer OL3025o is shipped with a bootable USB stick. This USB stick contains a complete backup of the original CompactFlash data (factory default). The CompactFlash can be recovered using the backup of the USB stick. The procedure how to recover the CompactFlash is described below.

To recover or update the OptoLyzer OL3025o obey the following procedure:

1. Switch off the OptoLyzer OL3025o.
2. Disconnect the connectors on the rear panel.
3. Unscrew the service panel.
4. Reconnect the power supply.
5. Connect a mouse, a keyboard and a monitor (not part of the shipment) according Figure 4-2.
6. Plug in the delivered bootable USB stick into a USB slot.
7. Restart the OptoLyzer OL3025o.
8. The OptoLyzer OL3025o displays a boot menu.

Note:
If no item is selected for some time the CompactFlash and the PCI Board are updated automatically (described in section 4.4 on page 22).

9. Enter ‘1’ for ‘Update CompactFlash’.
10. Follow the instructions. The CompactFlash memory will be overwritten.
11. After finishing the recovery procedure switch off the OptoLyzer OL3025o.
12. Remove the USB stick.
13. Disconnect the connectors on the rear panel.
14. Screw on the service panel.
15. Connect the power supply.
16. Restart the OptoLyzer OL3025o.
17. After the LED ‘R’ stops twinkling, switch off the OptoLyzer OL3025o.
18. Reconnect all cables.
19. Start the OptoLyzer OL3025o again.

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4.3 Update PCI Board (DOS Tools)

This USB stick also contains the DOS tools. Within the DOS tools the following options are provided:

- Check or Write License Keys
- Update FPGA firmware (OS8604)
- Update MOST Controller firmware (OS8805)

Both FPGA firmware and MOST Controller firmware update can be performed automatically (“easy”) or manually (“advanced”). For updating the OS8805 firmware, the integrated PCI Board must operate in loop-back mode. Connect Rx directly to Tx via a plastical optical fiber. A respective hint is implemented in the DOS tools.

The procedure to use the DOS tools is described below:

1. Switch off the OptoLyzer OL3025o.
2. Disconnect the connectors on the rear panel.
3. Unscrew the service panel.
4. Connect the power supply.
5. Connect a keyboard and a monitor (not part of the shipment) according Figure 4-2.
6. Switch on the power.
7. The OptoLyzer OL3025o displays a boot menu.

Note:
If no item is selected for some time the CompactFlash and the PCI Board are updated automatically (described in section 4.4 on page 22).

8. Enter ‘2’ for Update PCI Board (DOS tools).
9. Follow the instructions when working with the DOS tools.

For details how to use the DOS tools options please refer to the additional user manual UM_MOST_PC_Interfaces_DOSTools that can be found on the CD.

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4.4 Update All (CompactFlash and PCI Board)

The USB stick offers the possibility to automatically update the CompactFlash and the PCI Board (FPGA firmware and MOST Controller firmware) in one step. This option is preset as default in the boot menu of the USB stick.

It is assumed the OptoLyzer OL3025o is connected according Figure 3-3 and Figure 3-4. For updating the OS8805 firmware, the integrated PCI Board must operate in loop-back mode. Connect Rx directly to Tx via a plastical optical fiber. A respective hint is implemented in the DOS tools. The procedure to use the DOS tools is described below:

1. Switch off the OptoLyzer OL3025o.
2. Disconnect the connectors on the rear panel.
3. Unscrew the service panel.
4. Connect the power supply.
5. Connect a keyboard and a monitor (not part of the shipment) according Figure 4-2.
6. Switch on the power.
7. The OptoLyzer OL3025o displays a boot menu.
8. Enter ‘3’ for ‘Update All (CompactFlash and PCI Board)’. Alternatively wait for some time. Then this item is performed automatically.
9. Follow the instructions.
10. After finishing the update switch off the OptoLyzer OL3025o.
11. Remove the USB stick.
12. Disconnect the connectors on the rear panel.
13. Screw on the service panel.
14. Reconnect all cables.
15. Start the OptoLyzer OL3025o again.

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5 Technical Specification

5.1 Mechanical Characteristics

Mechanical Dimensions

Mechanical dimensions of the OptoLyzer OL3025o in millimeters, without screws, plugs and switches:

Height	Width	Depth
43.5	134	175

Table 5-1: Mechanical Dimensions of the OptoLyzer OL3025o

Environmental Specification

Protection against Over Temperature

The computer system integrates temperature sensitive components. Therefore do not cover the device with paper, textiles or other objects. Covering disables the passive cooling (cooling rips). Make sure to allow enough airflow to the computer system, when the device is assembled. Do never place the running computer system in a closed case or box. Clean the surface of the computer system from dust, oil and other isolating materials, to prevent a reduction of the cooling efficiency.

Operating mode:

Parameter	Values
Ambient temperature	0° to 50°C
Relative humidity (non-condensing)	80%

Non-operating mode (Storage):

Parameter	Values
Ambient temperature	-40° to 85°C
Relative humidity (non-condensing)	95%

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5.2 Electrical Characteristics

Power Supply

Operating Voltage: 8 V-30 V (DC)
Power Consumption: Operation (typical): 14 W

Power Input / Main Supply Connector

Pin	Description
1	Power
2	ION
3	GND

Table 5-2: Power Supply Connector

Technical Data of the Hardware Trigger Interface

Hardware Trigger	1		2		3		4			
Pin	1	2	3	4	5	6	7	8	9	10
Signal	GND	Input	GND	Input	GND	Input	GND	Input	GND	Do not connect (future use).

Table 5-3: Connector Pin List of the Hardware Hardware Trigger Interface

Table 5-3 describes the pin connection of the hardware trigger interface.

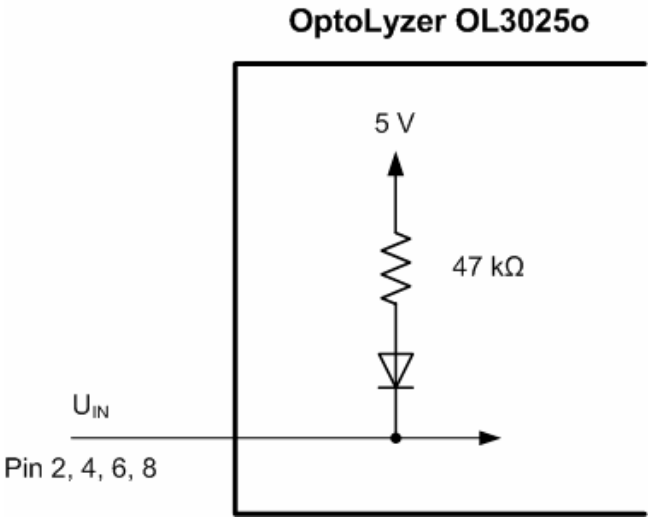

Figure 5-1: Pin Equivalent for Hardware Trigger Input Pins

Figure 5-1 shows that there is an internal pull-up to 5 V. The input is not compatible to TTL logic.

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- **Input:**

  Switching threshold = 4.5 V
  U_{IN} max = 16 V

Audio Line OUT

The electrical properties are described in Table 5-4.

Name	Description
Line OUT	Audio stereo signal output: RL_{min} = 3 kΩ (3.5 mm plug)

Table 5-4: Line OUT

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Appendix A: Further Reading

1. *OptoLyzer Socket Protocol* *
2. *OptoLyzer Suite User Manual* **
3. *OptoLyzer G2 30xx Start-up Guide* **
4. *Syntax Compiler BNBuild User Manual* **
5. *DOS Tools MOST PC Interfaces* *

* Contact support-ais-de@smsc.com.
** The current version of the documents can be downloaded from http://www.smsc-ais.com.

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Note:

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Note:

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